K&F SONA SUB

User's Manual

Revison 1.2
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Important Information, Please Read Before Use!

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1. Introduction

Thank you for your decision to buy a KLING & FREITAG sound system. To guarantee a trouble-free operating of the equipment and to allow your KLING & FREITAG SONA SUB system to achieve its full potential please read the operating instructions carefully before use. With the purchase of a SONA SUB system, you have acquired a large sound system with the highest possible quality and performance capabilities. As the owner of a SONA SUB system, you now have a versatile and highly professional tool which, when operated properly, is a true pleasure to use.

1.1 Symbols in User's Manual

This symbol indicates the possibility of life-threatening danger and a health risk for persons. Not following these instructions may result in serious health problems including potentially fatal injuries.

This symbol indicates a possibly dangerous situation. Not following these instructions may cause minor injuries or cause property damage.

This symbol gives instructions for the proper use of the described products. Not following these instructions may cause malfunctions or property damage.

This symbol indicates notes that help you to handle the described products easier.

1.2 Information about this User's Manual

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All specifications in this manual are based on information available at the time of publishing for the features and safety guidelines of the described products.

Technical specifications, measurements, weights and properties are not guaranteed.

The manufacturer reserves the right to make product alterations within legal provisions as well as changes to improve product quality.

All persons who use the speaker system must have this guide and all further information for safe operations available to them during assembly, disassembly, and use. The speaker system may neither be set up nor used until this manual has been read, understood and kept readily available on site.

We appreciate any input with suggestions and improvements for this manual. Please send this to us at the following address:

info@kling-freitag.de or to:

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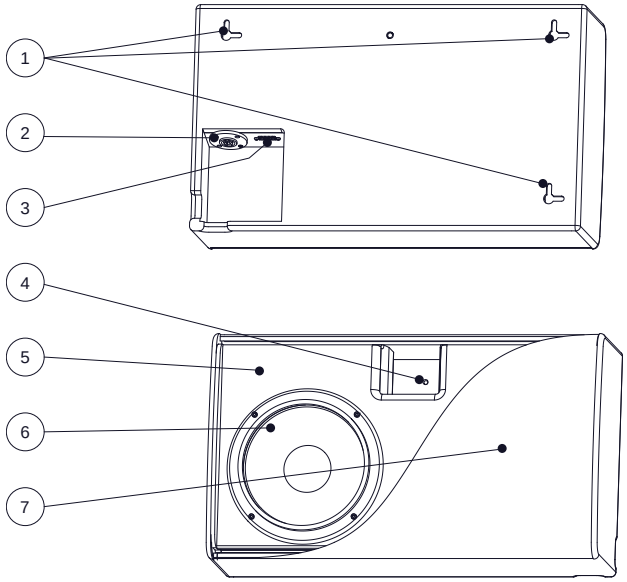
2. Product Description

The subwoofer SONA SUB is the ideal bass supplement for the speaker SONA 5. With its discreet appearance, it fits in nearly any architecture. The practical mounting points with a double keyhole design enable wall and ceiling installation. In addition to possible use with the K&F Controller CD 44, it can also be operated with a universal electronic crossover. This possibility makes it extremely attractive not only because of its convincing performance but also economically.

2.1 Scope of Delivery

- A subwoofer for use with the top K&F SONA 5. 3 mounting points based on the keyhole principle and a fixing hole for horizontal and vertical wall mounting.
- Drilling plan for marking mounting points for wall and ceiling mounting.
- 4-pin Phoenix plug for the corresponding connector in the speaker.
- Plug for fixing hole.
- User's Manual

2.2 Overview of Components



1. **Mounting Points** in double keyhole design for horizontal and vertical mounting.
2. **SPEAKON Connector** type NL4 MPR, parallel wiring to Phoenix connector.
3. **PHOENIX Connector** incl. plug connector, parallel wiring to Speakon connector.
4. **Fixing hole** with removable stopper. It serves to secure the enclosure after it has been hung onto the mounting points. **During use, the fixing hole must either be closed by the stopper or a fixing screw. Otherwise, strong interference may occur.**
5. **Speaker Enclosure**
6. **Speaker Chassis**
7. **Front grille**, mountable and demountable without tools.

2.3 Required signal processor

When using the SONA SUB, a signal processor is required such as an electronic crossover or the K&F Controller CD 44.

The signal processor must provide at least the following settings:

- 1 x high-pass 4th order Butterworth
- 1 x low-pass 3rd order Butterworth
- 1 x bell filter
- 1 x all-pass 1st order (Only if SONA 5 is filtered).

Further information in chapter [Configuration and Connecting Diagram] on page 13 ff.

2.4 Required mounting material

For wall and ceiling mounting:

- At least 3 screws (not countersunk) with
  a thread diameter of 6 mm,
  a head diameter of 10 mm minimum/ 13 mm maximum,
  and a head height of 6 mm max.
- Rawlplugs or other suitable mounting aids with official technical approval corresponding to the given requirements.

3. Safety Instructions

3.1 Mounting the Speakers / Wall and Ceiling Installation

Warning

The speakers may only be mounted to wall and ceilings by qualified personnel.

The technicians responsible for assembling the speakers on site are responsible for the safe setup and use of the speakers and guarantee this.

Never use signal cables or power cords for suspending, aligning or securing the systems.

Before carrying through ceiling and wall installations, it is essential to consider the load capacity of walls, ceilings and panelling as well as the stability and type of the construction. If there is wall panelling, for example, it is then necessary to examine the solidity of the wall and use the appropriate wall plugs.

Make sure to comply with the stipulated tightening torques.

If not otherwise stated in this manual, only original KLING & FREITAG parts may be used for mounting the speakers. The use of other parts - in particular parts by other manufacturers - is not permitted in this case.

Ensure that all installation connections comply with the applicable safety guidelines and that the size and strength are sufficient.

Ensure that all connections are secured against coming loose and that only authorized, statically tested and correctly sized supports, mounting equipment, wire ropes and chains are used.

As a basic principle, you must visually inspect mounted speakers at regular intervals. If there are signs of wear, cracks, or deformation, then you must replace the parts immediately. The visual inspection also includes checking the screwed connections on supporting elements.

The information described here does not relieve the user of the duty to follow the given safety requirements and legal regulations.

3.2 Notes for Mounting the Speakers

Caution

Mount the speakers securely. To avoid injury or damage, always be sure to mount the speakers securely so that they do not fall.

Please note that speakers can move as a result of vibrations. To prevent them from falling from their mounted position, they must be secured properly.

When laying out the connecting cables, make sure that nobody can trip.

3.3 Preventing hearing damage

Caution

Avoid beeing too close to operating speakers. This equipment is capable of delivering sound pressure levels in excess of 90 dB/SPL, which may cause permanent hearing damage.

3.4 Protecting the Speakers / Operating Safety

Important

In general, audio signals must not be overdriven. This may be caused by mixing consoles, equalizers, effect equipment, etc. and should be indicated on this equipment. When a power amplifier is overloaded at the output (clipping), then the amplifier should activate a clipping warning signal. Power amplifiers can also be overloaded at the input circuit without the amplifier signalling the clipping, i.e. when there is not sufficient headroom in the input circuit. We, therefore, recommend turning up the power amplifiers all the way and adjusting the level before the power amplifier in order to avoid overloading the input circuit. In any case, the signal must be reduced as soon as it sounds unnaturally distorted.

Operations without CD 44 Controller:

- To protect the speakers from being destroyed and to avoid fire hazard, they should only be operated with professional power amplifiers with a maximum rated output power of 150W@8Ω.
- If power amplifiers have power ratings lower than 75W@8Ω, then it is imperative that the amplifiers have clipping limiters. Alternately, you can also insert a clipping limiter before the amplifier.
- To achieve sensible acoustic results and to protect the speaker from mechanical destruction during use, the speaker must be filtered according to this manual. See chapter [Configuration and Connecting Diagram] from page 13.

Operations with CD 44 Controller:

- For optimal performance and operating safety of the SONA SUB speakers we recommend using the system controller K&F CD 44.
- When operating the loudspeaker with amplifers without clipping limiter and nominal amplifier power less than 75W@8Ω requires to set a Limit Reduction of 3dB for the K&F CD 44 controller.
- The destruction of speakers and the risk of fire as a result of a very rare power amplifier or speaker defect may not be avoided by the controller in any case.

For damage caused by

- overloading the speakers
- using power amplifiers with other than the recommended maximum output power

we do not assume warranty and excludes liability for possible consequential damage.

The following signals may damage the speakers:

- clipping power amplifiers
- permanent high-level signals with high frequency and continuous noise from feedback.
- permanently distorted high-level signals.
- noises, which occur when the amplifier is on while equipment is being con-nected, disconnected or switched on.

Do not install devices in any of the following places:

- where the devices are permanently exposed to direct sunlight.
- where the devices are exposed to high moisture or rain.
- where the devices are exposed to strong vibrations and dust.

Avoid damage caused by the speakers' magnetic fields

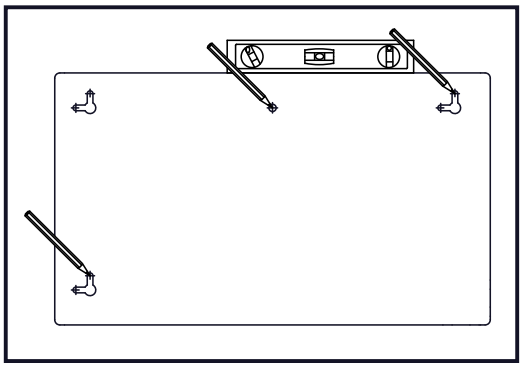
Speakers are permanently surrounded by a magnetic field, even when they are not connected. Therefore, during transport and placement of the speakers, it is important to ensure that there is a sufficient distance between the speakers and magnetic data media and computer/video monitors (except flat panels).

4. Wall and Ceiling Installation

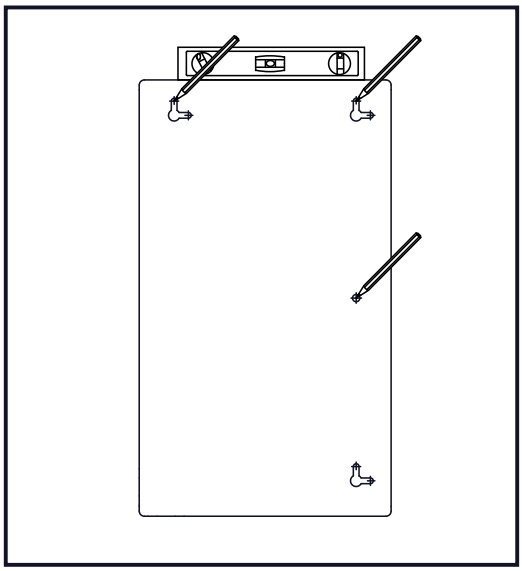
Using the provided drilling plan, mark the mounting points on the wall or ceiling.

When mounting, always choose at least two of the mounting points as well as the fixation point. Choose fasteners that are suitable for the wall or ceiling material. Use suitable rawlplugs if necessary.

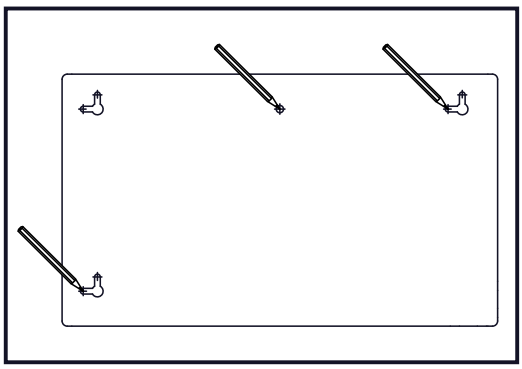
Horizontal wall mounting



Vertical wall mounting



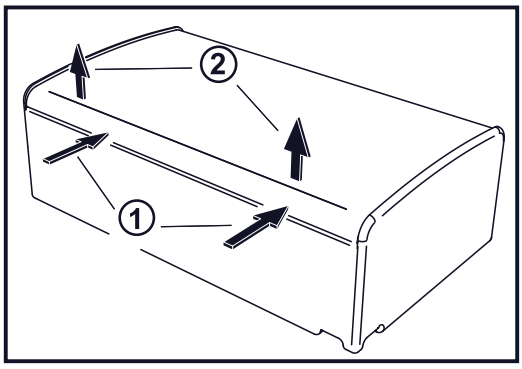
Ceiling mounting



Remove the grille:

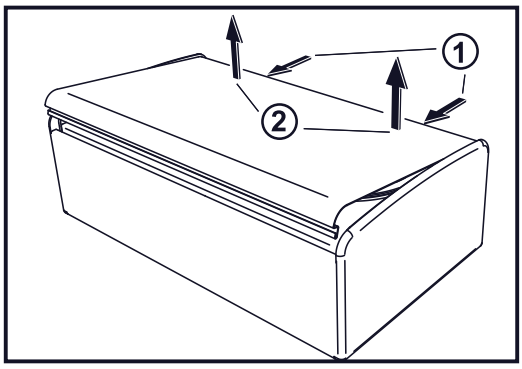
Push one side of the grille towards the middle of the speaker **(1)**.

Keep pushing the side and, while doing so, slide the side of the grille upwards out of the fastening groove **(2)**.

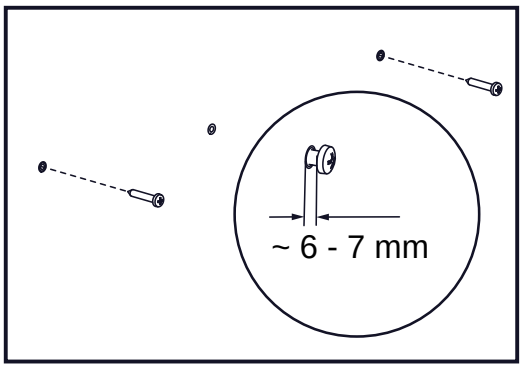


Now slide the other side of the grille towards the middle of the speaker **(1)**.

Remove the grille by pulling it upwards out of the fastening groove. **(2)**.



Turn the screws for the keyhole mounting points into the wall.

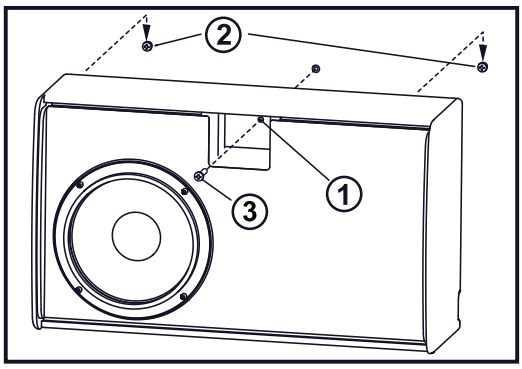


Remove the stopper in the fixing hole **(1)**.

Connect the speaker cables. Follow the instructions in chapter [Wiring] beginning on page 16.

At the keyhole mounting points, hang the speaker onto the screws **(2)** .

Fixate the speaker with the fixing screw **(3)**.

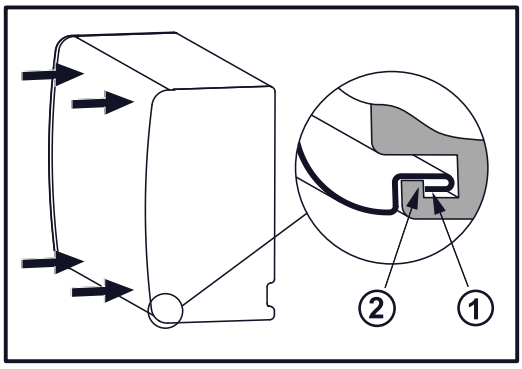


Important

During use, the fixing bore must be closed by a fixing screw. If not, strong interference may occur.

Re-install the grille. To install the grille, follow the removal instructions in reverse order.

Then push on the grille so that fold of the grille **(1)** is securely behind the fastening groove **(2)**.



5. Correct Ratio between Top and Bass Speakers

For a balanced sound reproduction, suitable for speech and average music material, one subwoofer SONA SUB can be combined with 2 tops SONA 5. This is valid as long as the amplifiers for SONA SUB and SONA 5 have the same overall gain and the SONA SUB is mounted on a wall or on the open floor (reference use).

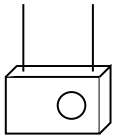
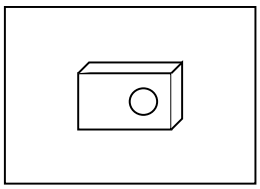
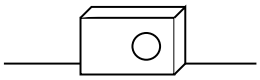
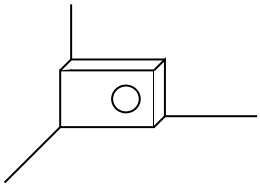
If more bass level is desired for DVD playback or reproducing very low-frequency signals (i.e. motor sounds), then the number of SONA SUB has to be doubled. For this type of use, the SONA 5 has to be used with filtering, since there is a risk of mechanical otherwise. For maximum performance and operating safety, select use with the CD 44.

For an additional bass boost the level increase which occurs in room edges and room corners can be used. The placement in room edges and room corners is also beneficial because of the excitation of more room modes which results in a more even bass coverage across the room.

The correct loudness ratio between tops and bass is, therefore, very dependent upon the bass's set-up location, the spatial geometry, the required playback material and, last but not least, your personal preferences. For this reason, the ratio between tops and bass should always be assessed on site, for example with a third-octave band analyser or a notebook with corresponding measurement software.

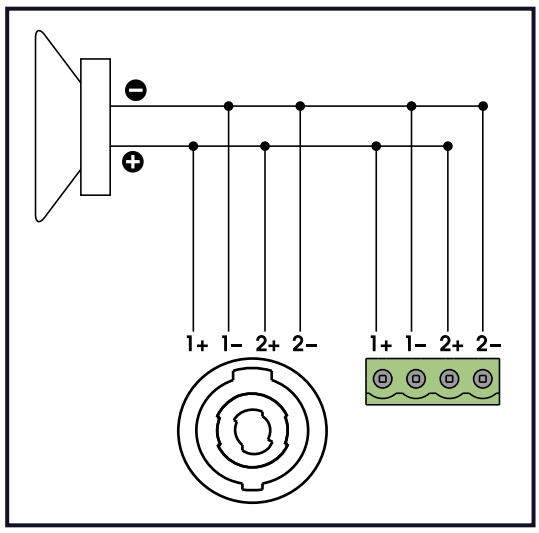
5.1 Level increase because of adjacent areas

As shown in the following table, adjacent areas can lead to significant level differences.

Setup location	Name	Level increase	Pictogram
Freely suspended	Free field (full space)	+/- 0 dB	
On a surface (Reference use)	Half space	ca. +3 dB to +6 dB	
In a space boundary	Quarter space	ca. +6 dB to +12 dB	
In a corner	Eigth space	ca. +9 dB to +18 dB	

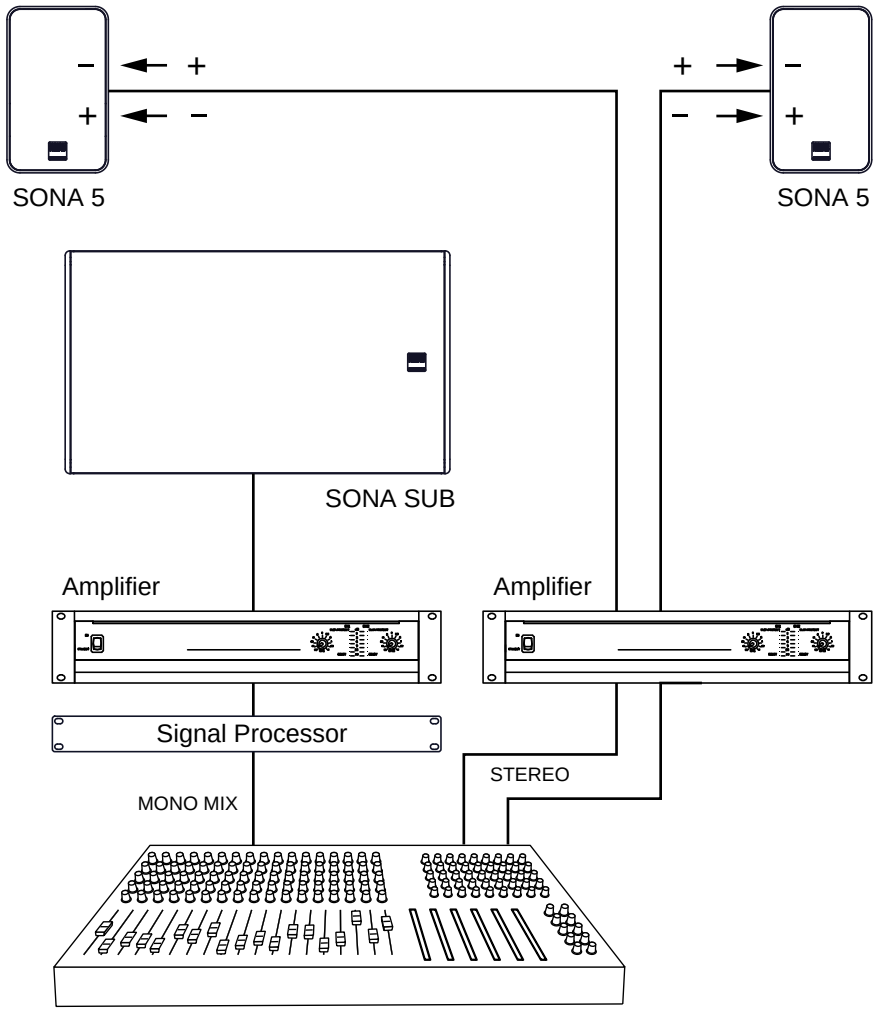
6. Configuration and Connecting Diagram

6.1 Terminal assignment



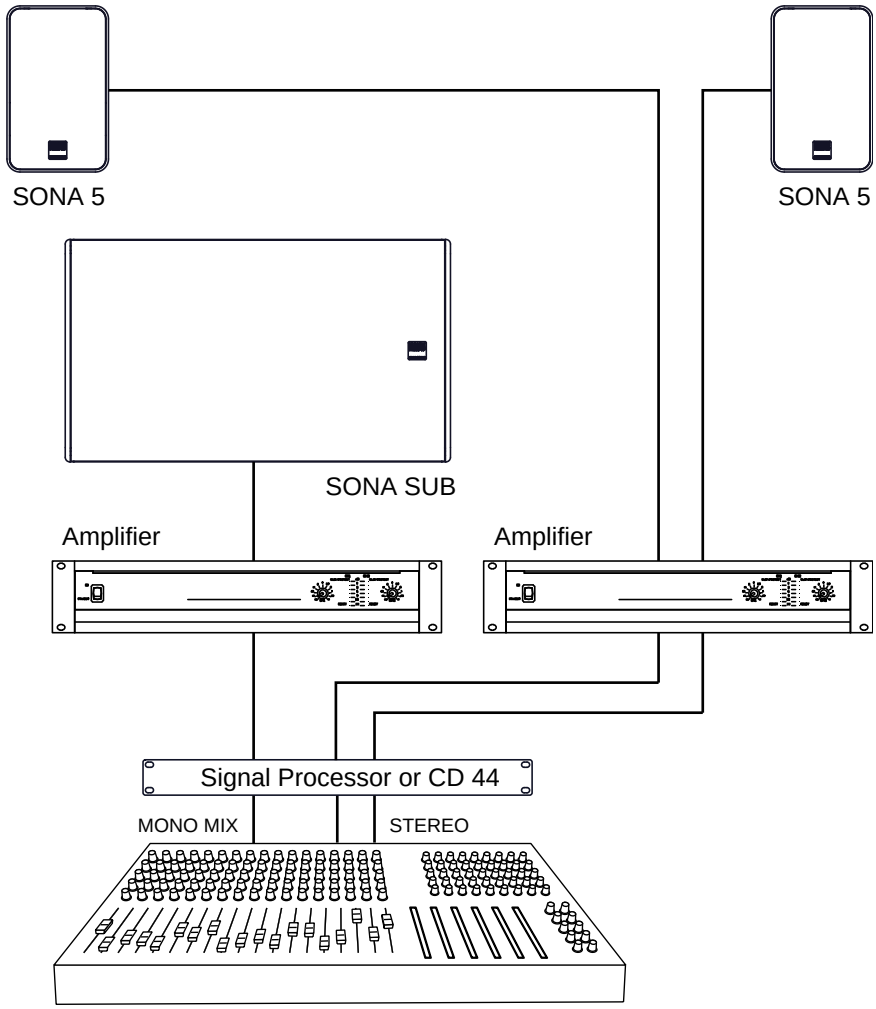
6.2 SONA SUB with 'SONA 5 unfiltered'

In this mode, the polarity of the SONA 5's input signal must be reversed.



	Signal processor settings
SONA SUB	High-pass, 32Hz, 4th order Butterworth Low-pass, 80Hz, 3rd order Butterworth Bell filter, 45Hz, +2dB, Q=2

6.3 SONA SUB with 'SONA 5 filtered'



Signal processor settings

SONA SUB:

High-pass, 32Hz,
4th order Butterworth

Low-pass, 80Hz,
3rd order Butterworth

Bell filter, 45Hz, +2dB,
Q=2

All-pass, 130Hz,
1st order, Q=0

SONA 5:

High-pass, 60Hz,
4th order Butterworth

CD 44 Settings

SONA SUB:

In the CD 44, choose the LSBlock [SONA SUB] for the speaker SONA SUB.

SONA 5:

In the CD 44, choose the LSBlock [SONA 5] for the speaker SONA 5.

7. Wiring

Warning

Electrical current of loudspeaker signal may be hazardous for the human body.

Always make sure the connectors secured against touch when the equipment is in use.

When using the Phoenix connector:

To guarantee the protection against contact on the Phoenix connector, you may only use the provided 4-pin Phoenix plug. This is also the case even if you only use two of the Phoenix connector's pins.

Always fully insert bared wire ends into the Phoenix plug such that bared parts of wire can not be touched.

The bared wire ends have to be accurately screwed into the plugs.

When using the Speakon connector:

The Phoenix connector is connected in parallel to the Speakon connector.

To guarantee protection against contact on the Phoenix connector, the provided 4-pin Phoenix plug must be plugged in during use. This is also the case even if you just use the Speakon connector. Without the Phoenix plug, the Phoenix connector's contacts have hazardous contact voltage!

7.1 Wiring instructions

Important

- Before connecting your SONA SUB loudspeaker switch off all equipment and turn down all level controls.
- Only use high-quality speaker cables with a sufficient wire gauge. The wire gauge depends on the length of the speaker cable.
  Minimum Wire Gauge (mm²)
  = Required Cable Length (m) / (2 x Speaker Impedance (Ω))
- For connections to the power amplifier inputs, please use 2-pin shielded microphone cable (balanced) with high-quality connectors.
- Avoid ground loops.
- Please pay attention to the pin assignments shown in this manual.
- Make sure that the +/- polarity of the speakers at the amplifier is correct. When simultaneously using power amplifiers from different manufacturers, be sure to use the correct specific pin configuration. It may be necessary to modify the pin configuration on the power amplifiers or on the connectors leading to them.
- Upon completing the wiring, ensure that the connected speaker channels are working in phase. To do so, use i.e. a phase checker. A phase error can also be recognized when the connected channels are used simultaneously. During simultaneous use the bass frequencies become notably quieter or the mid-frequencies such as voices cannot be located.
- If several loudspeakers are connected, the signal can be linked through parallel from one loudspeaker to the next. Please make sure that the total impedance of the loudspeakers R(Ω) is not lower than the minimal impedance indicated on the power amplifier.
  1/R1 + 1/R2 + 1/R3 + ... = 1/Rtotal

8. Operating the Speakers

Important

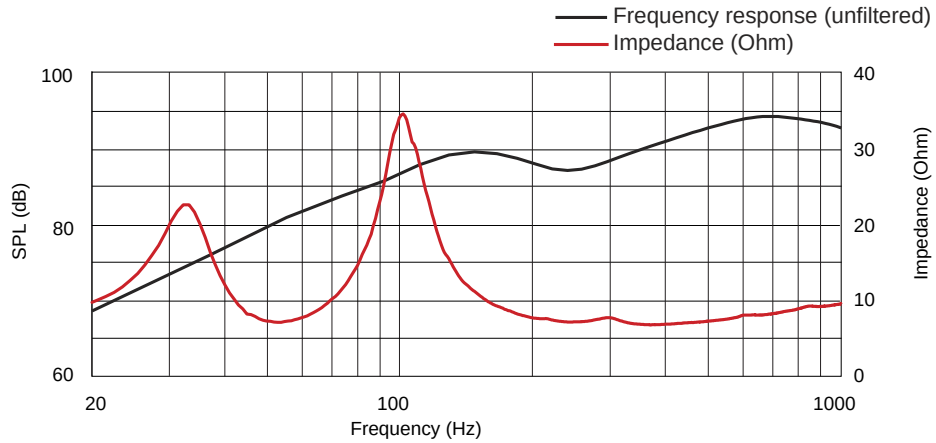
- Switch off all equipment and turn down all level controls of the mixing console and the power amplifiers.
- Wire your SONA SUB systems according to the instructions in this manual.
- Switch on the mixing console first, then the controller and the power amplifier. Always use the before mentioned switching order. Otherwise switching noises may damage the sound system.
- If there is interference, turn off all appliances in the reverse order and check all cable connections.
- Successively turn up the individual power amplifier channels and send a signal with low volume to the system. Check to see if the desired signals are applied to the intended speakers and make sure there is no interference.
- Turning down the input level controls may not always prevent distortions in the input section of the power amplifier, especially if this section has a relatively low headroom. A clipping signal may not be displayed by the clipping indicator then! To prevent signal interruptions or damages to the speakers, turn the level controls of the power amplifier to the maximum position, if possible. Set the output level of the mixing console or the controller to a level that doesn't overload the power amplifiers or decrease the limiter threshold of the controller.
- When turning off the system, the input controls for the power amplifiers should be turned down first followed by the power switches of the amplifiers. After that, the other appliances can be turned off.

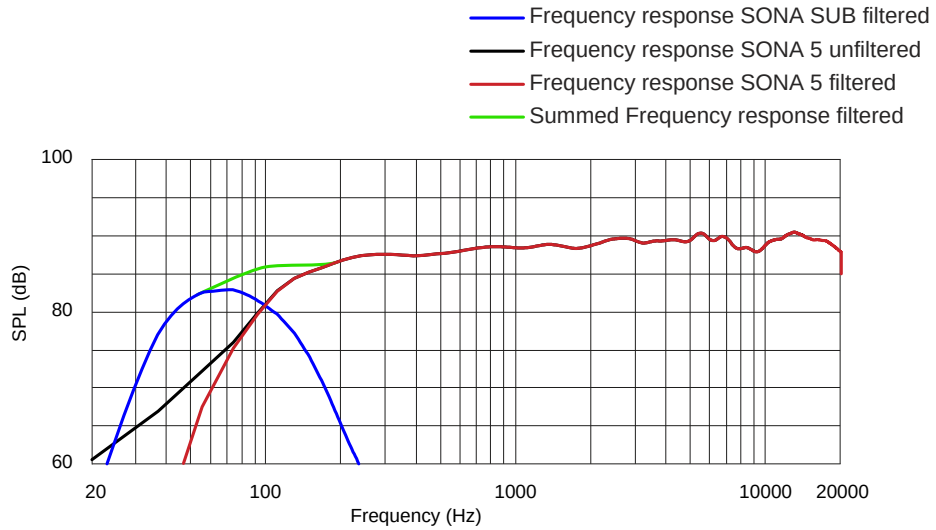
9. Technical Specifications

Design	Bass reflex system
Frequency range without filter (+/-3 dB / -10 dB)	70 Hz -400 Hz / 60 Hz - 450 Hz
Lower cut-off frequency with filter (-3 dB / -10 dB)	42 Hz / 32 Hz (half space)[1)]
Power handling	150 watts nominal[2)]
	300 watts program [3)]
SPL (1W / 1m)	89 dB SPL (half space)
Max. SPL (1m)	114 dB SPL (half space)
Components	8" woofer with 50mm voice coil
Impedance (nominal)	8 Ω
Wiring	4-pin Phoenix connector and Speakon NL4MPR (parallel)
Enclosure Design	12 mm multiplex enclosure, structured lacquer in black or white, 3 mounting holes in double keyhole design, and a fixing hole for vertical and horizontal wall and ceiling mounting, perforated metal grille in the enclosure colour that can be mounted and removed without tools.
Dimensions (W x H x D)	536 mm x 310 mm x 175.4 mm
Weight	7.5 kg
Options	'Special finish in RAL colours'

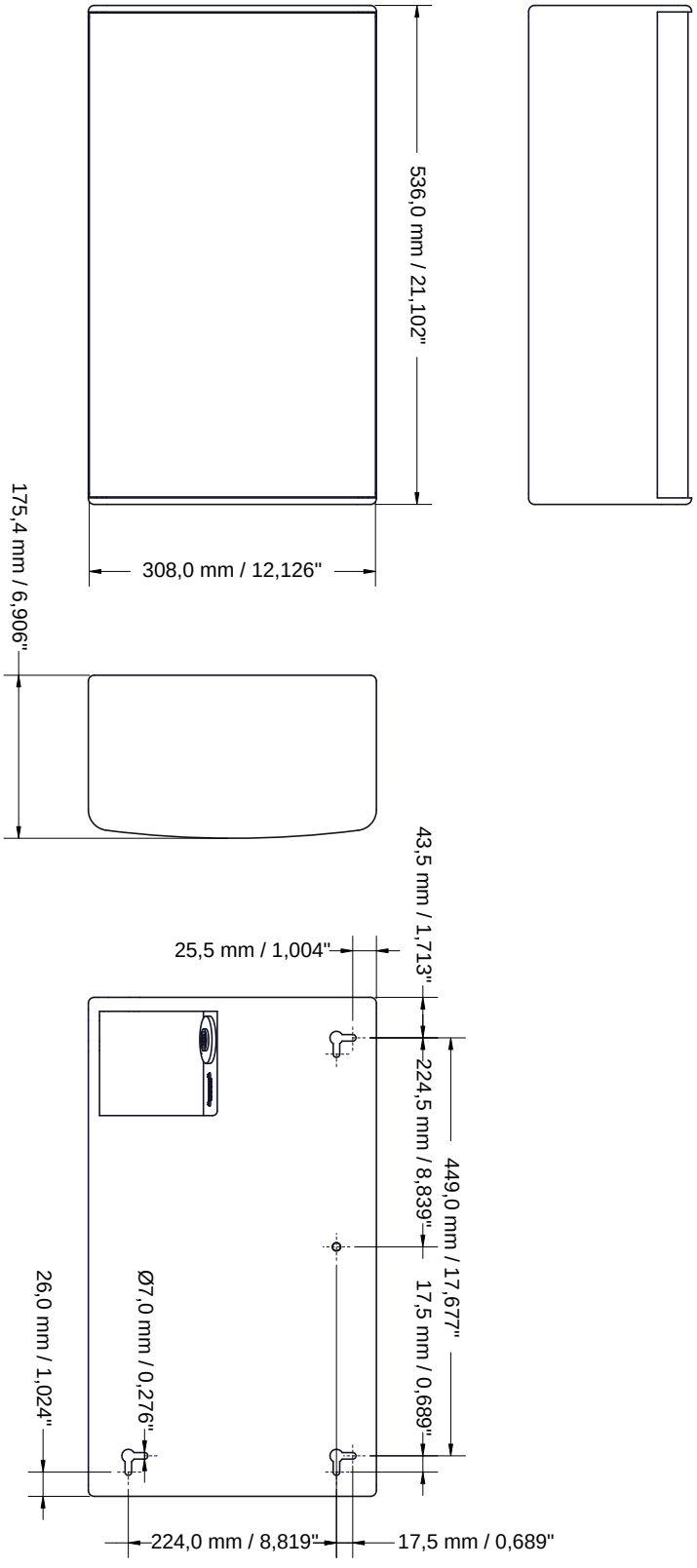
1) Half space corresponds to wall mounting; 2) Pink noise 40 - 250 Hz, 2 h; 3) is equivalent to 2) but with 50% duty cycle

10. Measuring diagrams





11. Dimensions



12. Disposal

12.1 Regulations for Disposal

12.1.1 Germany

It is not allowed to dispose of used electrical equipment as domestic waste.

Dispose of the device at public collection points for recycling!

The device is a so called dual-use product intended for domestic and commercial use. Therefore this device can be disposed of in public collection/recycling points, contrary to Kling & Freitag products which are limited to commercial use. Of course old devices can be returned to us and KLING & FREITAG GmbH will take care of appropriate disposal.

Explanation

ElektroG is the enforcement of Directive 2002/95/EC, regulating, amonst others, the collection and recycling of electrical components and equipment.

From 03/24/2006 onwards KLING & FREITAG GmbH has thus labelled all products mentioned in the WEEE with a sign with a crossed out waste bin and a white bar below. This sign indicates that the disposal as domestic waste is prohibited and that the product has been put into circulation on 03/24/2006 at the earliest.

KLING & FREITAG GmbH has been legally registered as a manufacturer with the German registration office EAR. **Our WEEE registration number is: DE64110372.**

12.1.2 EU, Norway, Iceland, and Liechtenstein

It is not allowed to dispose of used electrical equipment as domestic waste.

From 08/13/2005 onwards KLING & FREITAG GmbH has thus labelled all products for EU-Member countries as well as Norway, Iceland and Liechtenstein (except Germany) mentioned in the WEEE with a sign with a crossed out waste bin and a white bar below. This sign indicates that the disposal on domestic waste is prohibited and that the product has been put into circulation on 08/13/2005 at the earliest.

Unfortunately the European directive WEEE has been complied with implementing different national provisions of law throughout all member countries, which makes it impossible for us to offer consistent solutions for the disposal throughout Europe.

Responsible for complying with these provisions of law is the local distributor (importer) of each country.

For proper disposal of used products in accordance with these local provisions in the mentioned countries of the European Union (except Germany) please ask your local dealer or the local authorities.

12.1.3 All other Countries

For proper disposal of used products in accordance with local provisions in other than the above mentioned countries please ask your local dealer or the local authorities.